

Quantitative propagation of chaos for the Boltzmann equation.

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Abstract: The spatially homogeneous Boltzmann equation describes the evolution of the density of velocities of a gas comprised of infinitely many particles subjected to random binary collisions. We study the corresponding stochastic particle approximation and prove that it propagates chaos: its empirical measure converges towards the solution of the Boltzmann equation when the number of particles goes to infinity, with explicit rates in Wasserstein distance. The proof relies on a coupling argument with a suitable system of non-independent nonlinear processes.